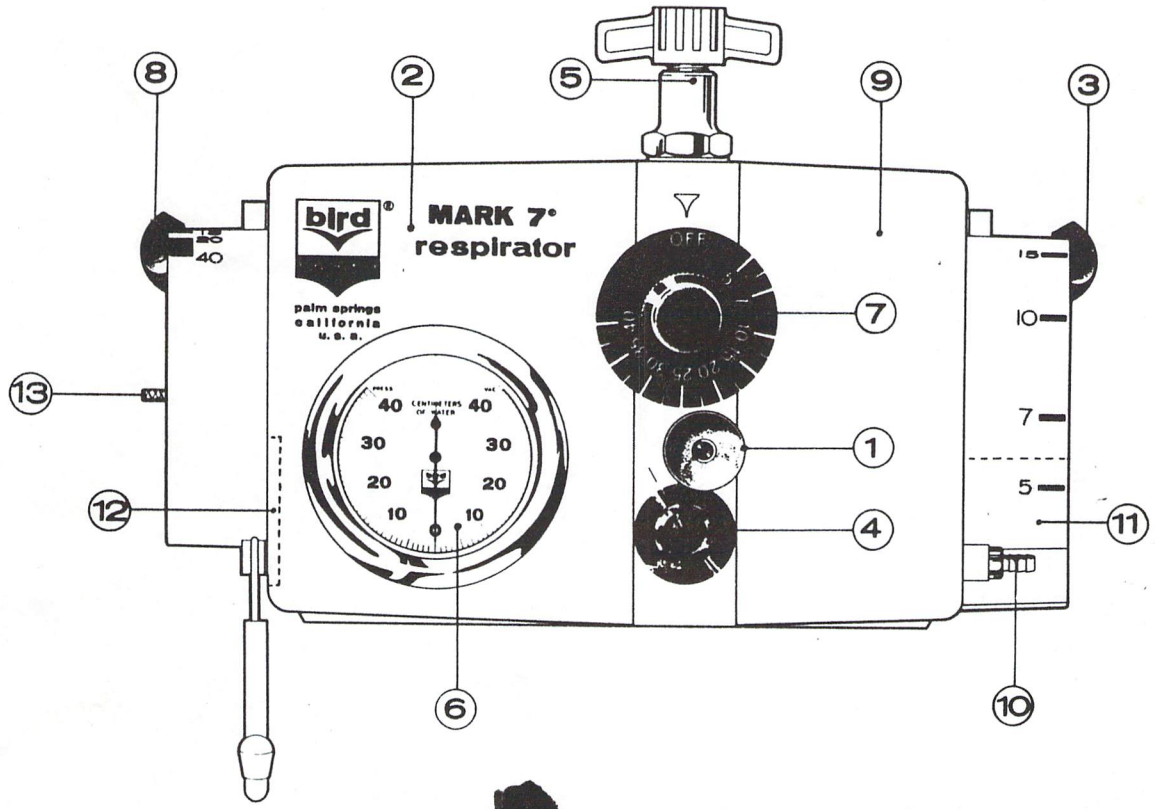
introduction to the bird® MARK 7



air filter .....

hand timer rod .....

inlet ASSEMBLY .....

flowrate .....

air-mix .....

sensitivity magnet arm .....

pressure compartment 9

mainstream breathing hose connection .....

pressure magnet arm .....

expiratory timer control .....

ambient compartment .....

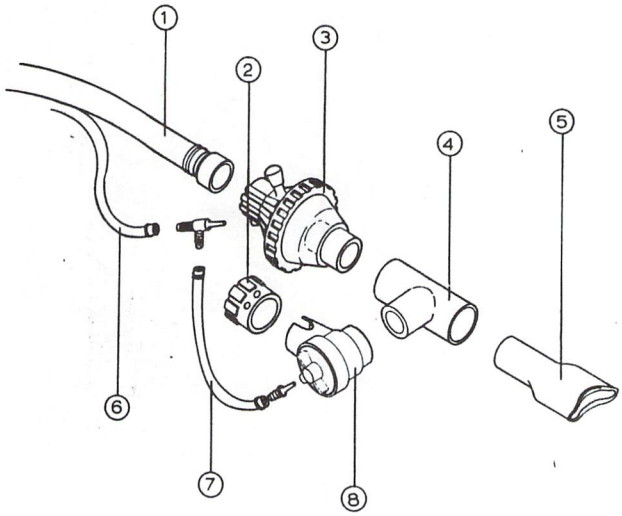
inspiratory power line connection .....

pressure manometer 2

NOTES:

See form 7.101

breathing head assembly for MARK 7®, 10® and 14



exhalation retard cap ..... ____

exhalation valve ..... ____

inspiratory power line ..... ____

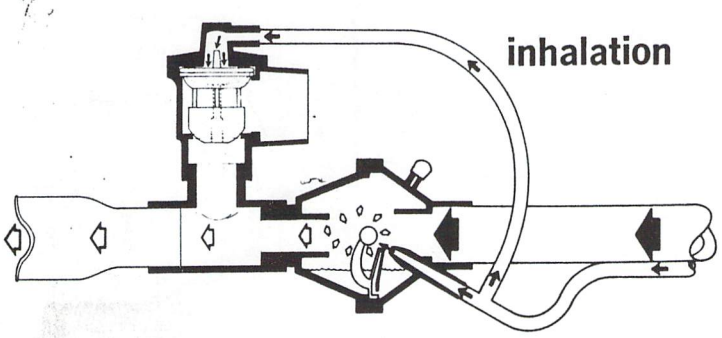
mainstream breathing hose ..... ____

mouthpiece ..... ____

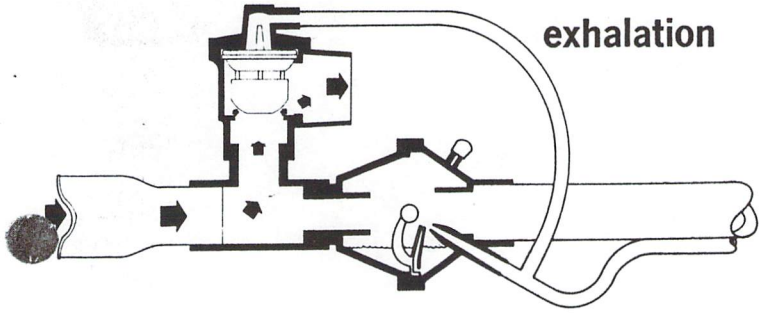
exhalation valve drive line ..... ____

therapy micronebulizer ..... ____

master tee adapter ..... ____



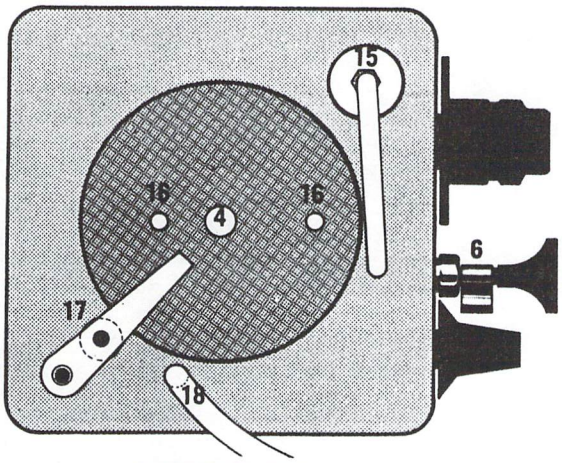
bird glengary model exhalation valve



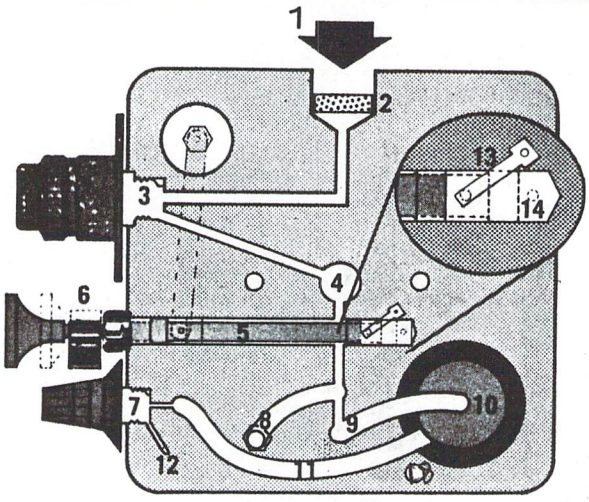
NOTES: _____

see form 1362

centerbody



AMBIENT SIDE



PRESSURE SIDE

drain hole
ceramic switch
expiratory timer arm
expiratory timer cartridge
expiratory timer cartridge-drain line
expiratory timer control
flowrate
air-mix
venturi jet

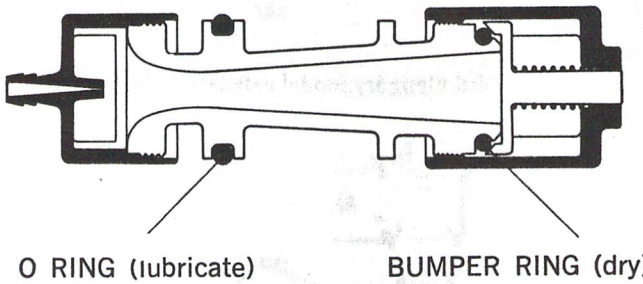
inlet filter
inspiratory power drive line
pressure communication holes
pressure manometer connecting tube
reed
safety catch
supply source
pressure drain hole
expiratory cartridge filling line

calibration of MARK 7

tool list:	**part no.**
common screwdriver 5"	
calibration screwdriver	**9993 417**
3/32 allen wrench	**9993 416**

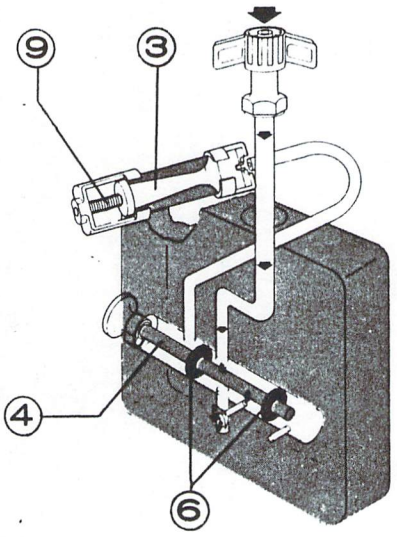
values	control setting
Positive pressure + 15 cm/H_2O	15
Sensitivity effort — 1½ cm/H_2O	15
Flowrate	15 S-7
Expiratory timer control (3 seconds)	15

VENTURI



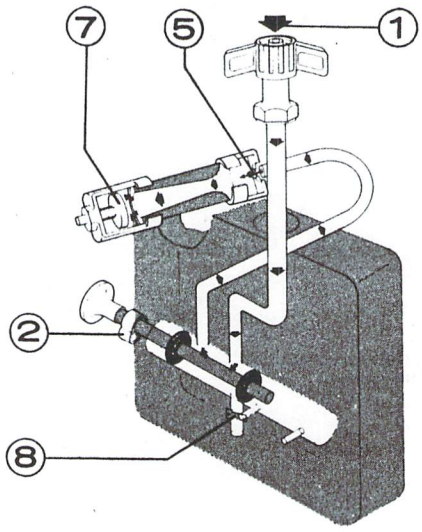
O RING (lubricate)

BUMPER RING (dry)



air-mix IN

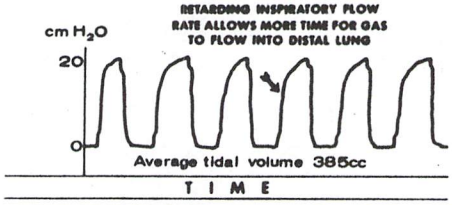
air-mix plunger .....
0-ring seal .....
venturi .....
spring .....



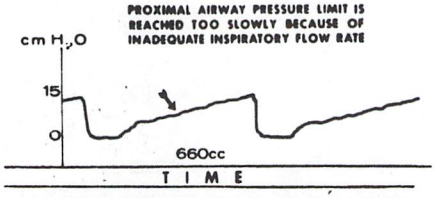
air-mix OUT

reed .....
safety catch .....
supply source .....
venturi gate .....
venturi jet .....

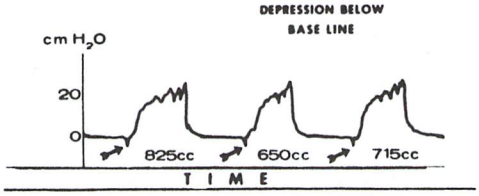
VARIOUS PRESSURE TIME CHARACTERISTICS OF THE bird® RESPIRATOR



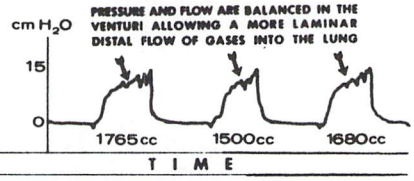
INSPIRATORY FLOW RATE RETARDED BUT NOT ENOUGH FOR PNEUMATIC CLUTCHING



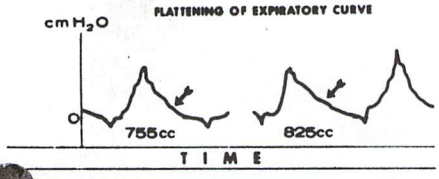
INSPIRATORY FLOW RATE TOO SLOW FOR INSPIRATORY POSITIVE PRESSURE LIMIT



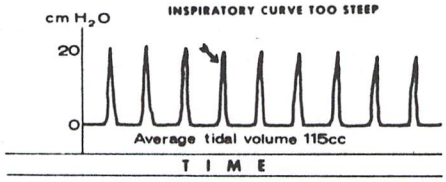
EXCESSIVE INSPIRATORY EFFORT NEEDED TO SWITCH VALVE ON



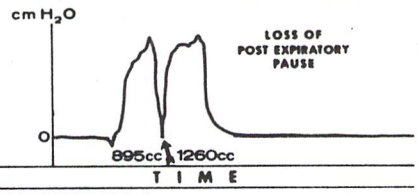
IDEAL PRESSURE FLOW COMBINATION PNEUMATIC CLUTCHING OCCURS



MECHANICAL EXPIRATORY RETARD OF GASES LEAVING THE LUNG

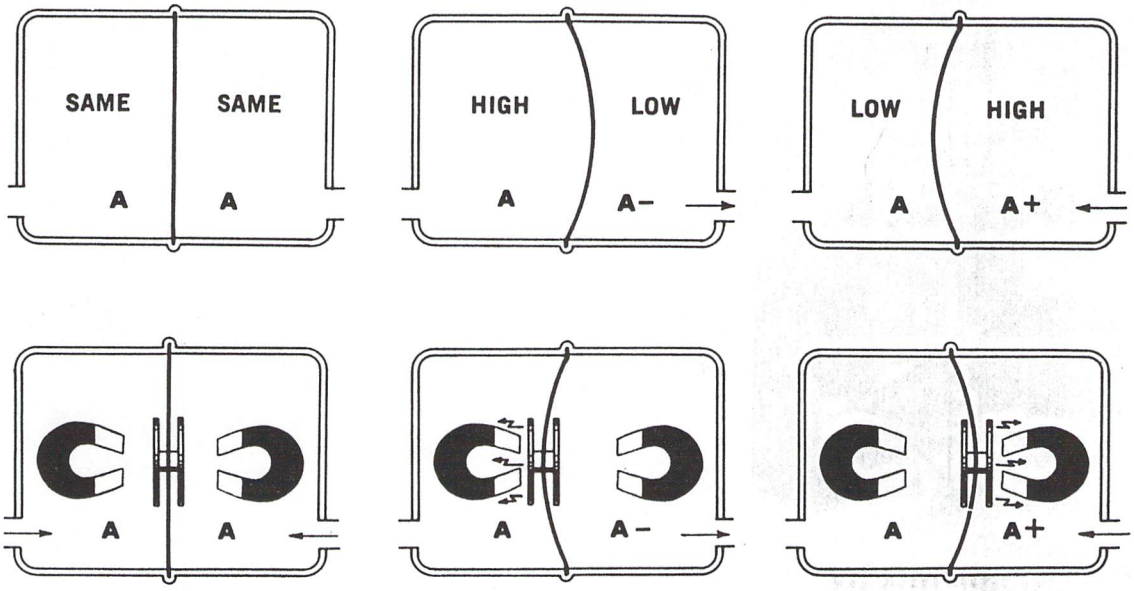


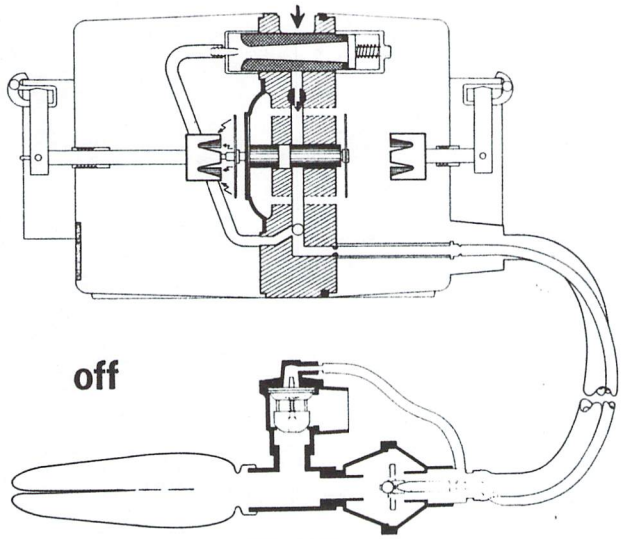
EXCESSIVE INSPIRATORY FLOW RATE

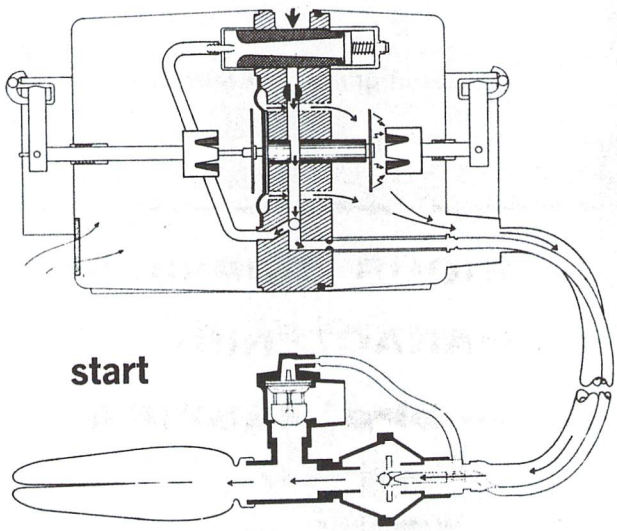


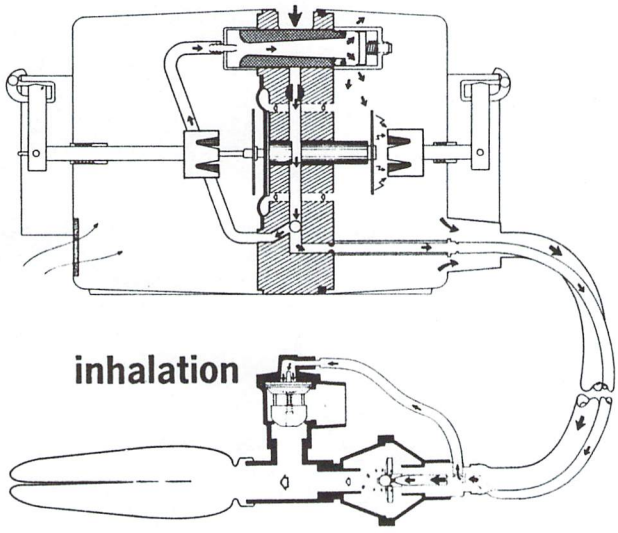
EXCESSIVE SENSITIVITY CYCLES VALVE TO INSPIRATION WHEN BASE LINE IS REACHED

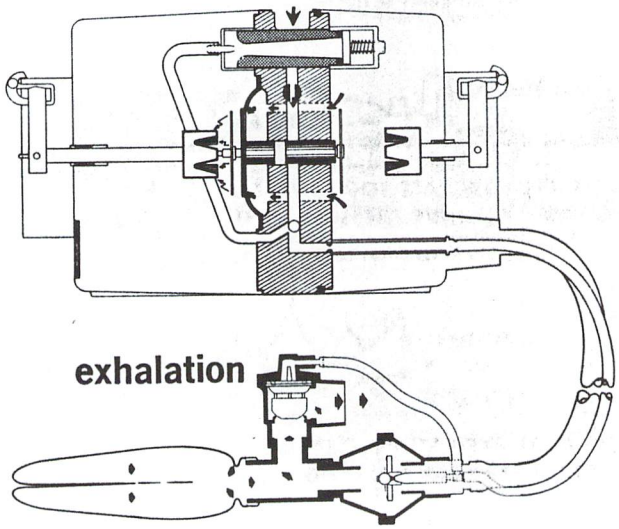
basic principles of bird MARK 7 respirator



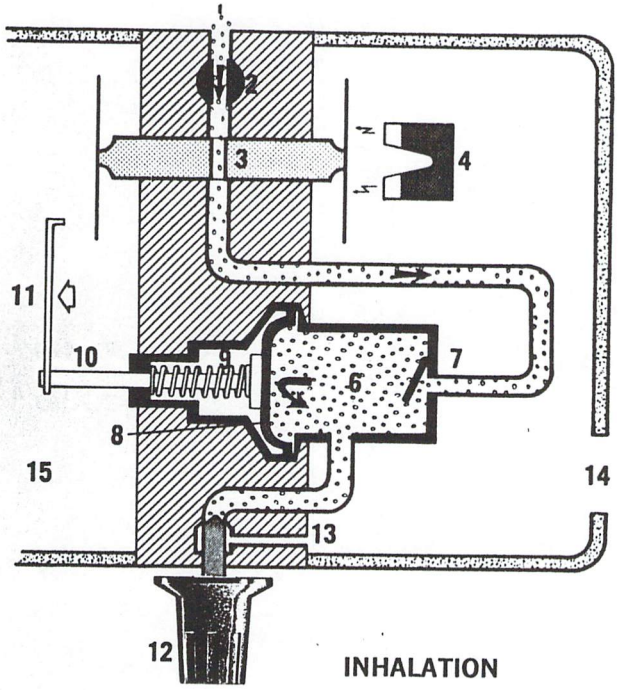




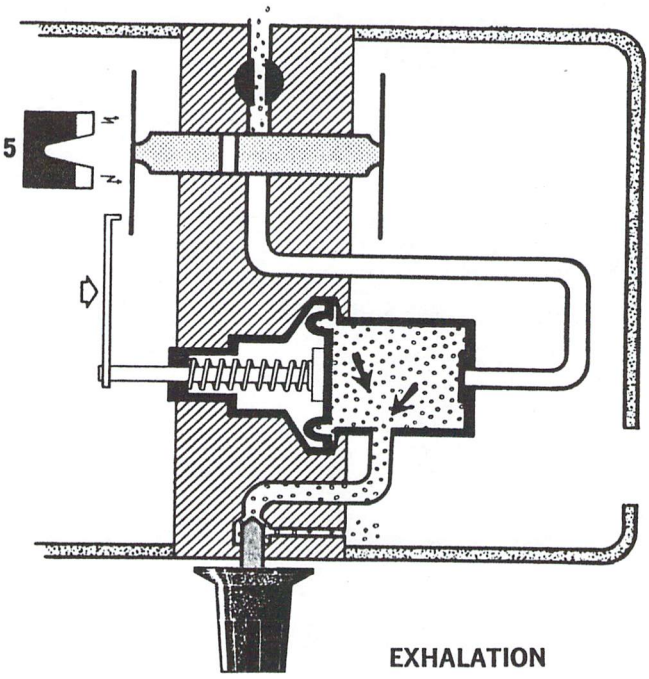




expiratory timer cartridge



INHALATION

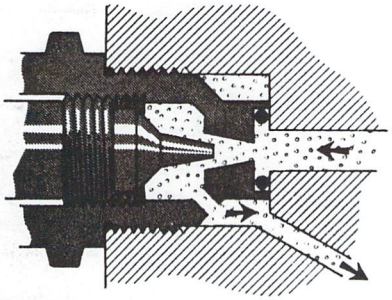


EXHALATION

EXPIRATORY TIMER CARTRIDGE

ambient compartment .....
drain hole .....
ceramic switch .....
check valve .....
diaphragm .....
expiratory timer arm .....
expiratory timer cartridge .....
pressure magnet .....

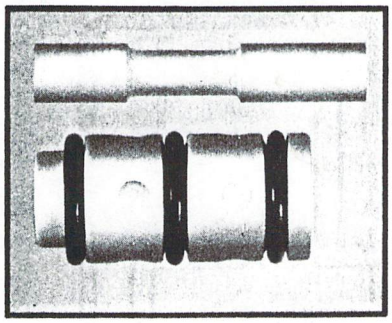
pressure compartment .....
plunger .....
sensitivity magnet .....
spring .....
supply source .....
expiratory timer control .....
flowrate .....

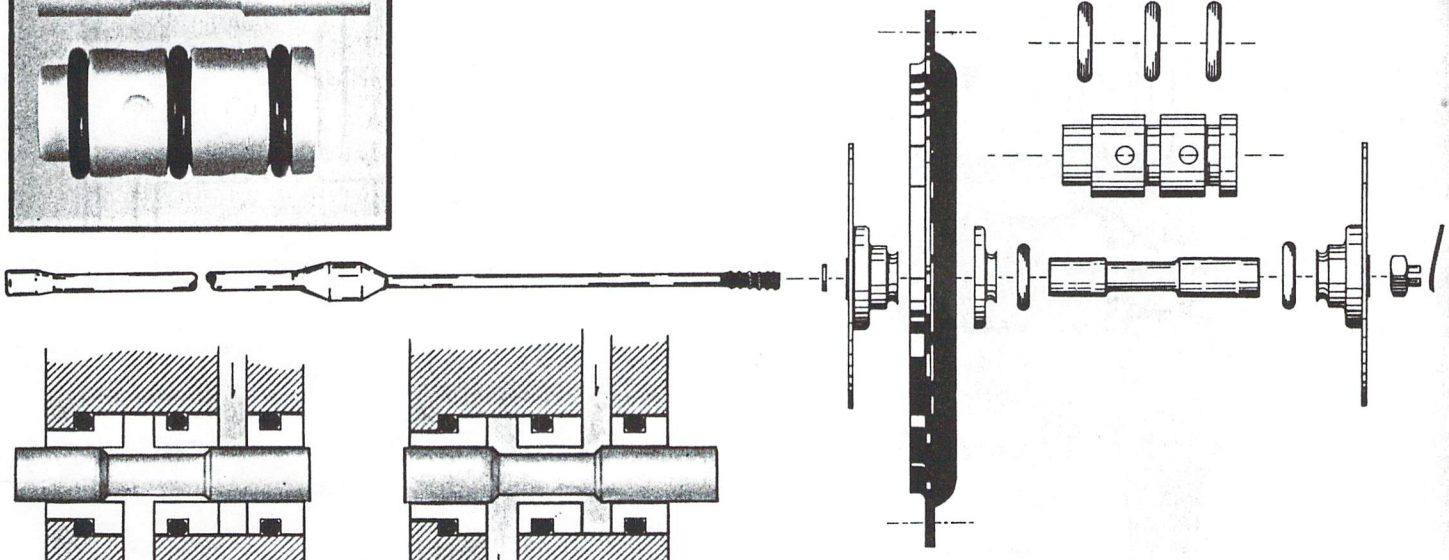


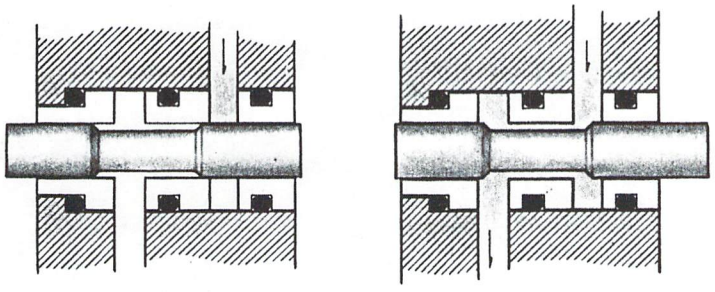
EXPIRATORY TIMER CONTROL VALVE

NOTES:

bird ceramic switch







OFF ON

NOTES.

standard aseptic procedures for sterilizing bird medical products

Sterilization room showing practical layout at the bird Respiratory Unit in Palm Springs, California.

The bird Corporation recommends that the following (sterilization) procedures be followed to sterilize all respirator accessories from the outlet of the respirator to the patient:

1. Equipment necessary includes the following items:

   a. (4) interstacking plastic wash tube of from 2 to 4-gallon capacity. One plastic tub should have holes punched in the bottom to act as a sieve.
   b. A wash basin large enough to accept the perforated tub.
   c. A pair of rubber gloves.
   d. A 14% sodium hypochlorite solution.
   e. A 1-ounce measuring cup or glass.
   f. Vanilla extract.
   g. A 17% aqueous solution of Zephiran® chloride.
   h. A suitable drying rack (for components to be sterilized.)

2. Solutions should be prepared as follows:

   a. Mix 1 ounce of 14% chlorine to each 2 gallons of water in one tub.
   b. Mix 1 ounce of 14% chlorine to each 2 gallons of water in the second tub.
   c. In the third tub, mix 1 ounce of 17% Zephiran chloride and about 10 drops of vanilla extract to each 2 gallons of water.

3. Disassemble exhalation valves, nebulizers, fittings and mouthpieces, etc., and place them in sieve tub.

see form 12765

4. Sterilize as follows:

   a. Soiled contaminated components should be first placed in the sieve tub, then immersed in the first chlorine bath for at least 10 minutes at ambient temperatures.
   b. Remove sieve containing components and rinse under cold water in sink.
   c. Insert sieve in second tub containing chlorine for 15 minutes at ambient temperatures.
   d. Remove sieve from second tub, rinse in sink briefly and then immerse in third tub containing Zephiran chloride and vanilla extract for a minute or so.
   e. Remove sieve from third tub and place contents in drying rack. When dry, return to service.

The above chlorine base sterilization can be carried out simply and directly in the hospital, pulmonary therapy clinic and physician's office. Over a decade of experience with the above procedures have not demonstrated any evidence of cross infection.

Proper sterilization of medical respirators and their accessories used in all clinical facilities is of paramount importance. Failure to follow adequate aseptic procedures in the sterilization of medical respirators will result in cross pulmonary infections in the pulmonary therapy clinic. Of equal importance is the frequent sterilization of respirator components used to maintain long term mechanical respiration in the patients with minimal pulmonary reserves who could ill afford additional respiratory embarrassment.

All components of medical respirators exposed to high moisture levels such as the breathing tubes, nebulizers, exhalation valves and other accessories are ideal culturing areas for mixed pathogenic microorganisms.

As the long term use of medical respirators and ventilators continue to increase, the rate of secondary pulmonary infections continue to rise, basically because of poor aseptic techniques.

All medical facilities should have a sufficient number of spare respirator accessories such as breathing circles, tubes and breathing head components to allow the entire system between the respirator and the patient, who is receiving mechanical ventilation, to be changed at least every 24 hours. Sterilization of inline nebulizer every 8 hours. Failure to meet these standards can lead to severe, if not fatal, pulmonary infections.

Cross infection in the pulmonary therapy clinic, whether it be an inpatient or an outpatient facility, can be controlled by sterilizing the entire breathing head assembly used on each patient immediately after use. In addition to the above, all tubes leading from the respirator to the breathing head assembly should be sterilized at least once daily.

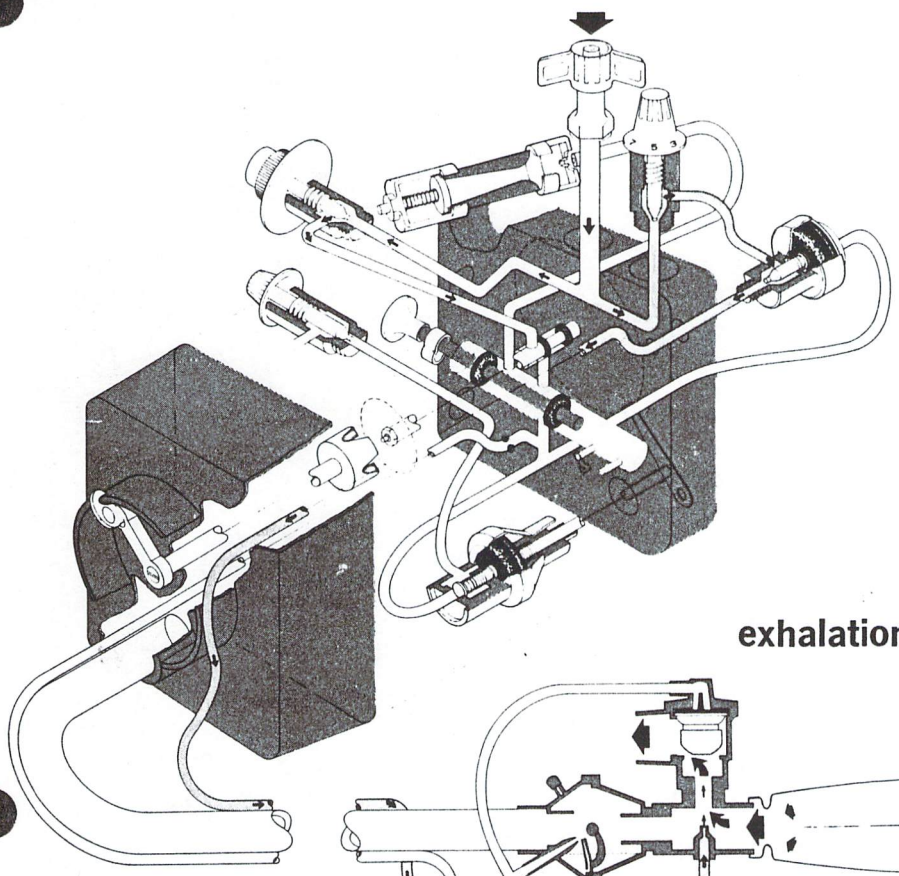
Gas sterilization is the simplest method to sterilize the respirator properly. Various mixtures of ethylene oxide and other dispersing gases are used as well as 100% ethylene oxide. Current experience indicates this method of sterilization to be compatible with plastic components of bird respirators, provided that elevated temperatures and pressures are not used. Gas sterilization in combination with temperatures of 140°F or above will cause crazing or cracking of some plastic materials. The long aeration time required for soft plastic and elastomer materials sterilized by this method would seem to favor cold sterilization of such materials.

The sodium hypochlorite solution used for swimming pool purification is generally a 14% solution. Standard household solutions such as Clorox®, Purex®, etc. are 5% solutions so, if they are used, triple the quantity.

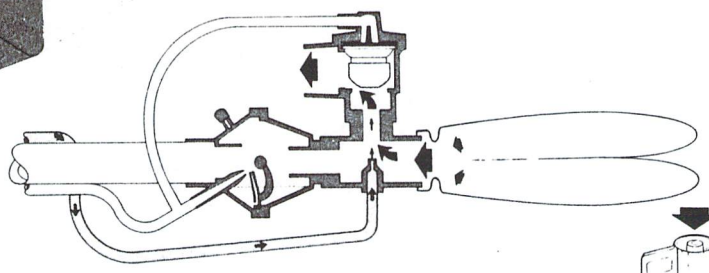
Washing respirator accessories with soap and water act mechanically to "float" microorganisms from the surfaces of immersed components; however, this method does not necessarily destroy these organisms. The soapy film formed upon the water surface can adhere to the components as they are lifted out of the wash water only to recontaminate the components. If a detergent is added to break surface tensions and reduce residual films, they may or may not have sufficient bactericidal activity. If the detergent is anionic, it will not destroy gram-negative microorganisms.

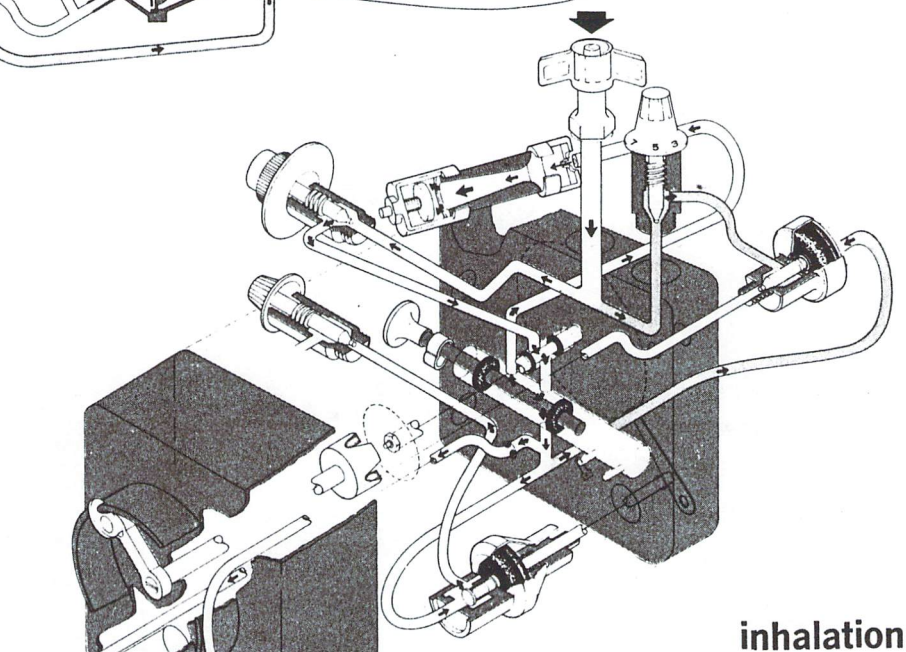
NOTES:

basic principles of MARK 8 respirator

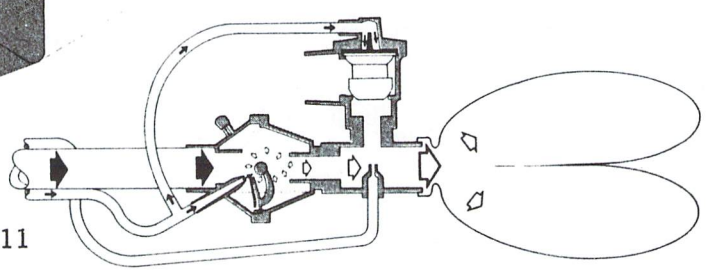


exhalation



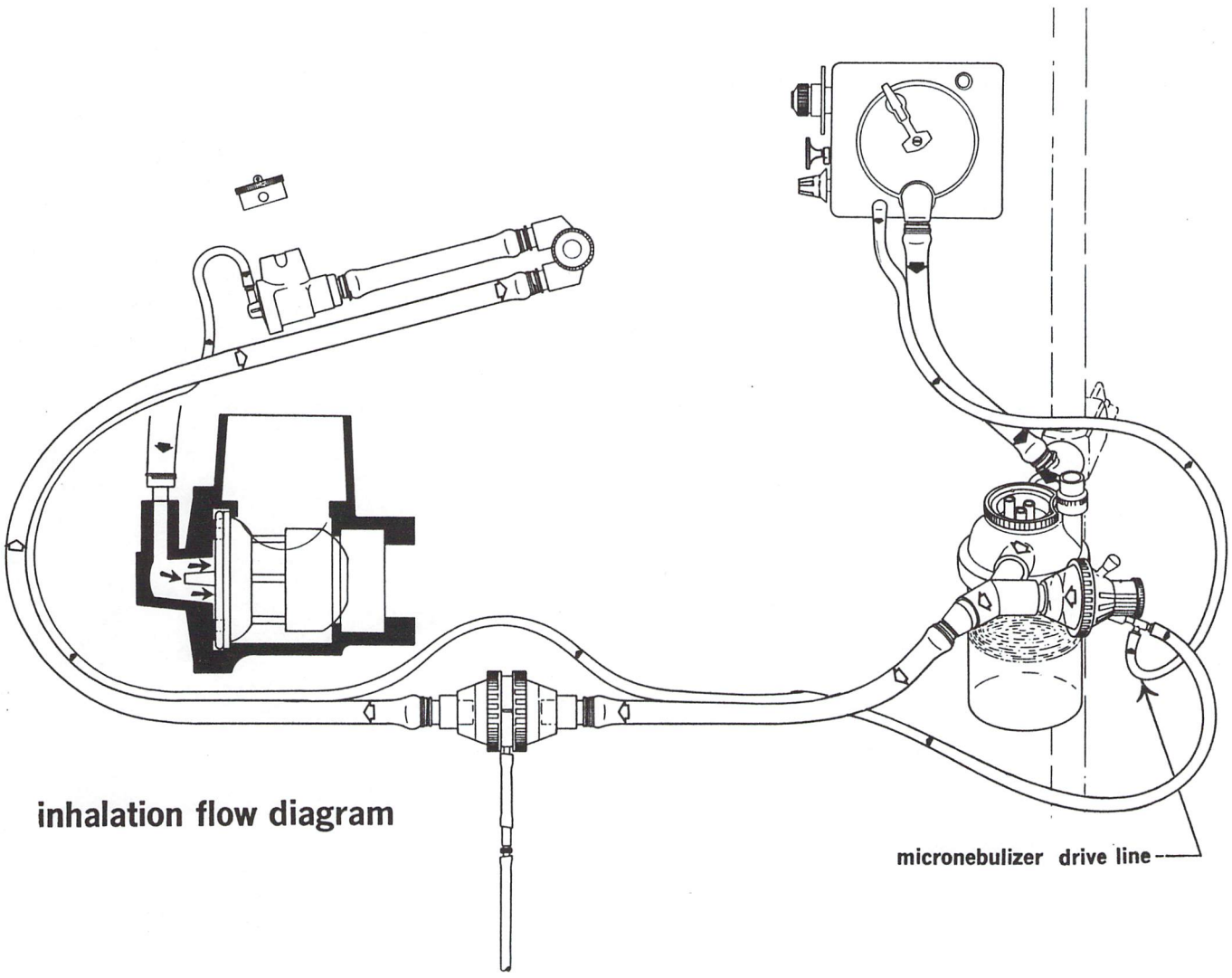


inhalation

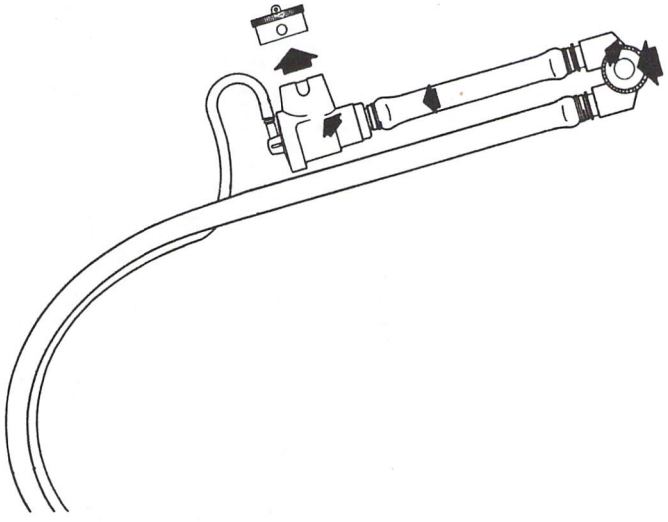


see form 8.101

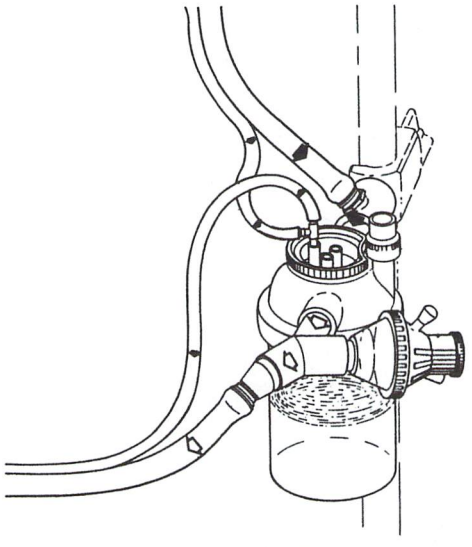
MARK 7 and 10 principles of positive phase Q circle system



inhalation flow diagram



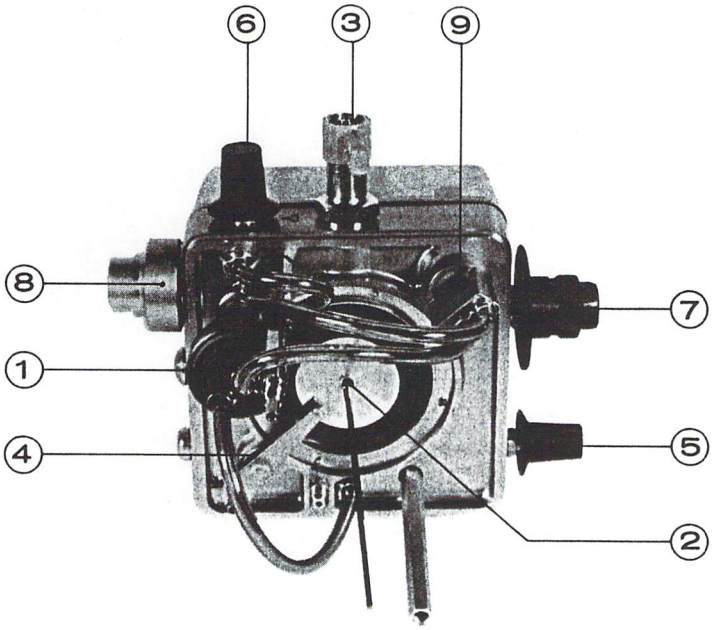
exhalation flow diagram



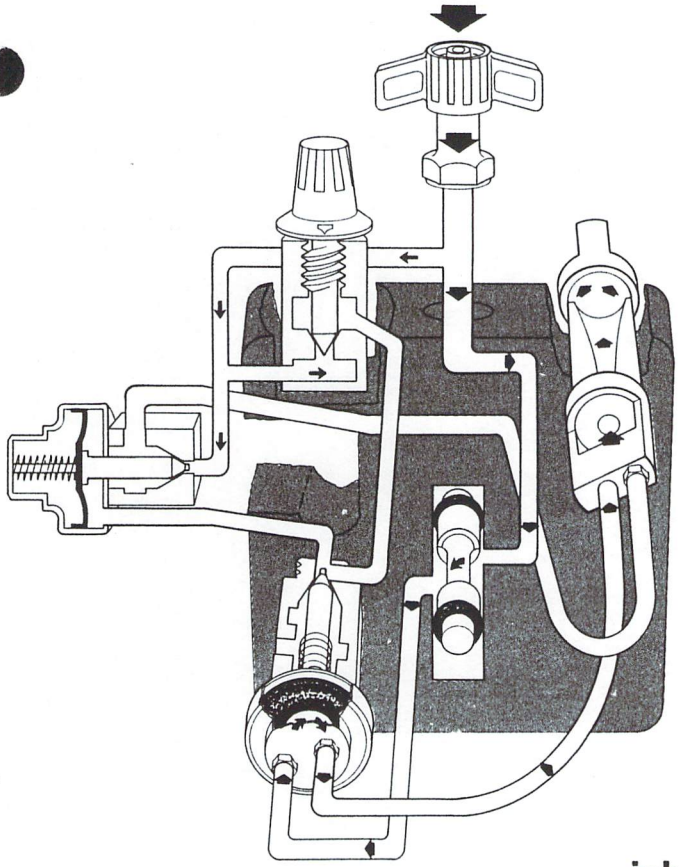
inline nebulizer

see form 3167

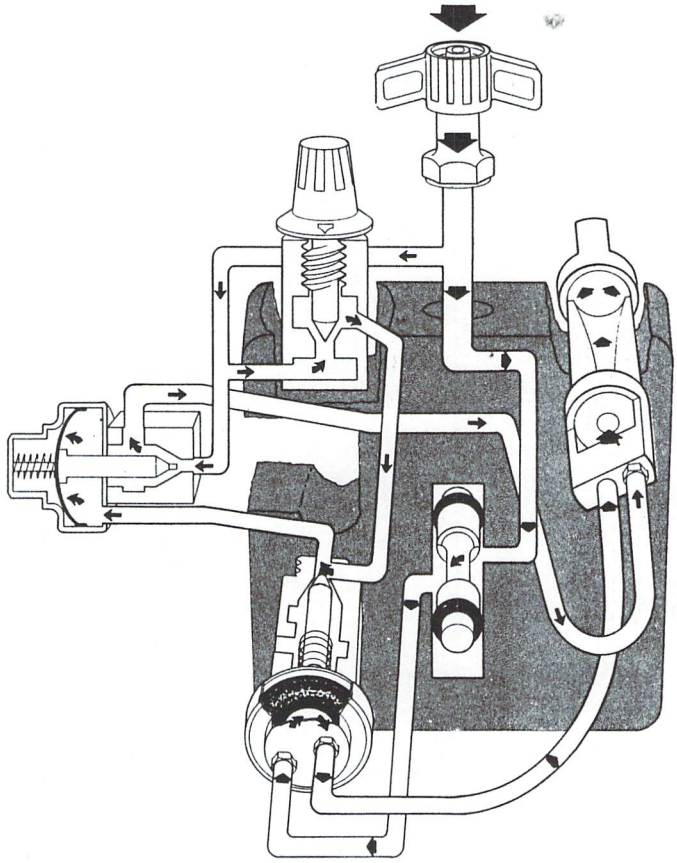
bird MARK 10®
leak compensating positive phase respirator



venturi
air inlet
terminal flow control
expiratory timer control
flow accelerator cartridge
flow rate valve
ceramic switch
expiratory timer cartridge
flow interruptor cartridge



MARK 10 normal ventilation



MARK 10 terminal flow diagram

inhalation

see form 10.101/10.201